

Participatory Forest Management in Ethiopia: Learning from Pilot Projects

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Abstract Different arrangements of decentralized forest management have been promoted as alternatives to centralized and top down approaches to halt tropical deforestation and forest degradation. Ethiopia is one of the countries piloting one of these approaches. To inform future programs and projects it is essential to learn from existing pilots and experiences. This paper analyses five of the pilot participatory forest management (PFM) programs undertaken in Ethiopia. The study is based on the Forest User Group (FUG) members' analyses of the programs using selected outcome variables: forest income, change in forest conditions, forest ownership feelings and effectiveness of FUGs as forest managing institutions. These variables were assessed at three points in time—before the introduction of PFM, during the project implementation and after the projects ended. Data were collected using group discussions, key informant interviews and transect walks through the PFM forests. The results show that in all of the five cases the state of the forest is perceived to have improved with the introduction of PFM, and in four of the cases the improvement was maintained after projects ended. Regulated access to the forests following introduction of PFM was not perceived to have affected forest income negatively. There are, however, serious concerns about the institutional effectiveness of the FUGs after projects ended, and this may affect the success of the PFM approach in the longer term.

Keywords Participatory forest management · Forest user groups · Forest conservation · Ownership feelings · Institutional effectiveness · Ethiopia

Introduction

Decentralized governance is considered conducive to increasing the accountability of institutions at all levels (Crook and Manor 1994), and in providing more effective management of natural resources at local level (Ribot 2003). Particularly, decentralized forest management has been hailed widely to hold the potential for halting tropical deforestation by insuring tenure security and more responsible forest governance (Angelsen and Wunder 2003; Cavendish 2000; Poffenberger 2006; Sunderlin et al. 2005; Wily and Mbaya 2001). Since the forest decentralization approach emerged in southeast Asia in the late 1970s, the area of forest under some form of decentralized management has increased drastically (Sunderlin et al. 2008). This paper focuses on a specific form of forest decentralization, Participatory Forest Management (PFM), that has been defined as the “exercise by local people of power or influence over decisions regarding management of forests, including the rules of access and the disposition of products” (McDermott and Schreckenberg 2009, p. 158). A core principle of PFM is local collective action (Ostrom 1990), with the active participation of local grassroots and external involvement having a supportive rather than managerial role (Arnold 1991). The approach is entrusted to achieve the dual objectives of improved forest management and forest based livelihoods for participating households.

A number of studies have evaluated whether PFM has lived up to its expectations, with methodologies ranging

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from holistic case studies (e.g. Lund and Treue 2008; Springate-Baginski and Blaikie 2007) to statistical analyses based on data from larger surveys exploring relationships between proxies for characteristics and outcomes (Persha et al. 2011). General regularities may be established with large cross-country data sets, while contextualized advice for improving a specific PFM model will often benefit from a case study approach. Generic factors that are relevant for evaluating PFM experiences, including resource characteristics and institutional arrangements, have been developed by Wollenberg (1998) and Schreckenberg and Luttrell (2009). Maryudi et al. (2012) emphasize the need to also assess the outcome of any PFM scheme according to its stated objectives. Motives for introducing PFM may vary and may have consequences for the way projects and programs are established, as well as the relevant outcome parameters (Wollenberg 1998). Given the magnitude of international donor support to PFM, an assessment of implications of this aspect is also relevant (Bruce 1999; Hobley 1996, 2007; Shahbaz et al. 2007; Springate-Baginski and Blaikie 2007).

The present paper provides an assessment of the PFM pilot programs implemented in Ethiopia since the mid-1990s, and it thereby provides information of relevance for scaling up best practices. Aspects addressed are impacts on the forest resource, contributions of PFM to livelihoods, and the appropriateness of the established institutional arrangements.

PFM in Ethiopia

The introduction of PFM in Ethiopia was officially founded on three complementary beliefs held by forest authorities and donors: (i) centralized and expert-led forest management practices have been unsuccessful so far and will not succeed in the future; (ii) participation of local communities, which hold the major stake in forest resources around them, is the most effective strategy to achieve sustainable forest management, and (iii) forests offer multiple social, economic and ecological roles to local communities, and are capable of generating sufficient and sustainable livelihoods to take them out of poverty (Kubsa et al. 2003; Temesgen et al. 2007). Ethiopia faces both high deforestation rates and high reliance on forest products for the construction of rural livelihoods. The present forest cover in Ethiopia is 4 % (Earth Trends 2007); it is believed to have declined from about 40 % at the end of the nineteenth century (Dessie and Christiansson 2008). A case study in southern eastern Ethiopia found the contribution of forests to average total annual household incomes to be 23–53 %, depending on income quintile (Yemiru et al. 2010).

PFM was initiated in the late 1990s in two regions of Ethiopia, Oromia and Southern Nations Nationalities and People Regional State (SNNPRS). State owned forest areas (natural and planted) were handed over to local communities organized into forest user groups (FUGs). Members of FUGs are typically from the same Kebele (lowest administration unit) and they live in or close to the forest designated for PFM. Before a forest area was formally handed over, the requirements were the development of a management plan and contract signature between the relevant government authorities and the FUGs. Current forest proclamations do not specify the requirements of the contract or the monitoring of FUGs' performances. FUGs have to form and register as cooperatives to be legally recognized; cooperatives may form district-level Unions. In the Oromia region all forestry activities used to be handled by the Regional Bureau of Agriculture and its district line offices prior to 2007, and succeed first by Oromia Forest Enterprises Supervising Agency (OFESA) between 2007 and 2008, and since then by Oromia Forest and Wildlife Enterprise (OFWE), a public forest enterprise established in 2009. OFWE is directly answerable to the Oromia region government executive council and PFM is organized under its district branch offices. In SNNPRS forestry activities are implemented under the authority of the Regional Bureau of Agriculture and its district line offices. These offices with the support from NGOs established FUGs and are supposed to continue assisting them in technical and legal matters, particularly in post project phases. In practice, the Kebele administration is the local level government body to assist FUGs, but it is not mandated to monitor their performance.

Ethiopia has been implementing a national PFM scaling up program since 2010 (MoARD 2010), apparently without making use of the experiences gained regarding the institutional setup (Limenih and Temesgen 2011) and the importance of donor support for project sustainability (Gobeze et al. 2009) from eight PFM pilot projects established with the support of international non-governmental organizations (INGOs) and bilateral development aid mainly GIZ (formally known as GTZ), Farm Africa and SoS Sahel (Temesgen et al. 2007). In this paper we analyze experiences with decentralized forest management in Ethiopia gained from five pioneer PFM pilot projects. Using an analytical framework based on Wollenberg (1998) and Schreckenberg and Luttrell (2009) we identify factors influencing PFM pilot project performance in terms of forest resources conservation and livelihood improvement. The study provides important lessons that may inform the design of an Ethiopian national PFM program as well as such programs in other countries. The analysis focuses on outcomes of PFM from the members' point of view; the important aspect of national level access to forests and related distributive mechanisms are not assessed in

this paper. Preliminary findings were presented and discussed with government and project representatives in Addis Ababa in January 2011.

Analytical Framework

Decentralization is defined as “any act by which a central government formally cedes powers to actors and institutions at lower levels in a political, administrative and territorial hierarchy” (Ribot 2004, p. 9). The policy literature distinguishes between two broad forms of decentralization: deconcentration, whereby powers are shifted to lower levels within an administrative hierarchy, and devolution (or democratic decentralization), whereby powers are formally ceded by the central government to democratic local governments (Agrawal and Ribot 1999; Crook and Manor 1998).

Decentralization in the form of PFM is considered a tool for socially responsible forest governance. It is assumed that the increased legally recognized access to vital subsistence, and possibly cash incomes, to forest users will drive sustainable forest management and use (i.e. the forest resource is conserved compared with the unsustainable resource extraction occurring in open access situations) through collective action, following the common pool resource theory (Baland and Platteau 1996; Ostrom 1990). However, such a win-win scenario only occurs under certain conditions, and the identification of these is the subject of much research (Agrawal 2001, 2003; Poteete and Ostrom 2003). Table 1 lists a number of characteristics considered important when analyzing the outcomes of PFM forms of forest governance. An additional key parameter affecting the outcomes of PFM is also the stated management objectives—what the project intended to achieve (Maryudi et al. 2012). Apart from looking at indicators of the individual objectives, impact assessments need to assess whether achievement of the management objectives in their totality is feasible. For example, while PFM schemes often aim to achieve both forest conservation and improvement of local livelihoods one of the two tends to prevail and there are few examples of unambiguous overall success (Belcher and Schreckenberg 2007).

The quality of the forest resources handed over for PFM is important in affecting impacts and goal achievements. Local forest users may not be able to invest in the conservation of a highly degraded resource that will yield benefits only after considerable time (Wollenberg 1998). Therefore, it is important to consider whether the area and state of the forest handed over will allow forest users to expect a profit within an acceptable time frame, given alternative options (Uberhuaga et al. 2011). Another element affecting the success of PFM is the formal

Table 1 Analytical framework for evaluation of PFM projects in Ethiopia

Characteristics of PFM	Parameters for evaluation
A. Project conditions	
Management purposes	Stated management purposes Local needs and expectations to PFM
Project management approach	Types of support provided: forest oriented versus complementary
B. Forest resource potential	
Forest resources characteristics	Condition of forest during handover (availability of timber and NTFPs) Forest area per user household
Resource pressure	Types of extraction activities (Timber, NTFPs, only firewood, etc.) Rate of deforestation (area deforested, etc.)
C. Institutional arrangements	
Authorities, rules and powers	Local authority: accountability, de jure and de facto powers FUG executive committee de jure and de facto powers Membership criteria Rules on access to cash and subsistence forest products Degree of rule implementation Fairness of benefit distribution
D. Outcomes of PFM	Indicator
Livelihood improvement	Benefits from forest
Forest conservation	Forest condition
Local motivation	Ownership feelings
Appropriateness of institutional arrangements	Institutional effectiveness

Based on Wollenberg (1998) and Schreckenberg and Luttrell (2009)

institutional arrangements put in place. These provide the framework within which PFM is implemented and are therefore critical to the performance. The institutions represent legal entities for the transfer of responsibilities. On the one hand, the legalization, the level of power for decision making (i.e. the extent of power vested on the institutions), and the support from higher level authorities determine how successful these institutions are. On the other hand, internal factors such as homogeneity or heterogeneity of members, the number of households included (indicating the level of pressure on the forest resources), as well as the skills and integrity of local administrators of the institution also affect outcomes. Wollenberg (1998) emphasizes the importance of supporting external economic and political environments. This implies the need to analyze the importance of the economic context when analyzing individual incentives for conservation and the

role of outside actors in supporting or otherwise influencing the outcomes of PFM schemes.

A crucial point in the design of PFM schemes is the access to benefits from the forest (Ribot et al. 2006). This may be determined by central authorities and by the local authorities, for example through the rules for decision-making, forest management and forest product appropriation and distribution (Schreckenberg and Luttrell 2009). How rules are set and whether they are observed or not are additional important aspects proposed by the common pool resource theory (Ostrom 1990). Individual incentives for forest conservation may depend heavily on what types of rights are provided to forest users. In most cases sustainable forest product harvest levels have not been identified, and extraction rules are therefore often conservative estimates made by forest officers (Bekele et al. 2007). A subsequent complication may be that monitoring of the forest resource is complicated or just not undertaken. Hence, the outcomes of forest decentralization are highly dependent on the way it is implemented in practice (Sunderlin et al. 2008). In relation to benefit distribution Thoms (2008) finds that equitable benefit distribution is not a prerequisite for conservation in PFM projects in Nepal. It is not clear whether this lack of correlation can be generalized, but given that an additional aim of PFM often is poverty reduction, fairness in benefit distribution seems to be an important indicator of success.

The outcome parameters used to assess the relative success of PFM include the state of the resource and impacts on local livelihoods; these reflect the main objectives of most forest decentralization programs. The indicators of institutional effectiveness and ownership feelings are both ends and means inasmuch as these are desirable in their own rights but they are also prerequisites for the long-term continuance of the initiated PFM program, i.e. the project sustainability (Lund and Treue 2008).

Methods

Study Sites

The selected study sites are five PFM pilot projects in Ethiopia, all of which are in their post project phases. The sites are located in the Oromia and SNNP Regional States of Ethiopia (Fig. 1). They cover different forest types and socio-cultural settings (Table 2). In Adaba-Dodola FUG members live inside the forest, while in the other sites the majority of the members live just outside the forest. The forest serves as the main source of wood and non-wood forest products and as a grazing ground for livestock. Except Mankubsa and Yabello, which are analyzed as two cases although implemented by one NGO, sample pilots

were implemented by different NGOs that followed somewhat differing implementation modalities. The reason for treating Mankubsa and Yabello as two cases is that these two forests are located more than 100 km apart and are considered as two institutionally separate entities by the authorities.

Data Collection

A multiple case study design was followed, where the five completed PFM pilot projects provided the individual cases. A common research protocol (Yin 2010) developed on the basis of the analytical framework was followed. For each study site data were collected to describe the forest resource potential, the PFM institutional arrangements and the outcomes of PFM. Methods included key informant interviews, participant observation, transect walks, group appraisals and literature review. In the following the individual methods are described:

- (1) Key informants included FUG members and a few non-members, Kebele administrators, FUG executives, local and higher level officials from forestry authorities, the cooperative promotion office and civil society organizations. The key informants provided information on the characteristics, performance and history of PFM.
- (2) Participant observation in two workshops facilitated by the Federal Ministry of Agriculture, the regional government forest departments and PFM projects: Annual Ethiopian PFM Working Group Meeting, held in February 2010 and a workshop organized to raise awareness of OFWE staffs on PFM, August 2010. This was possible because the first author worked in the Ethiopian Department of Forests and for PFM pilot projects.
- (3) Transect walks were conducted to observe the current forest condition and verify features mentioned in discussions with FUG members. The researcher selected two to three among several routes suggested by the forest users. Observations included forest regeneration, level of encroachment and protection efforts exercised by groups.
- (4) A total of 52 group appraisals in 46 selected FUGs were conducted to assess forest users' perception of the outcomes of PFM in three periods: before and after the introduction of PFM, and after the end of the donor funded pilot projects. A two-stage sampling technique was followed to select FUGs and individuals: first, in each site we purposively selected FUGs that varied in terms of number of members (pressure on forest), ethnic composition (social cohesion), initial level of forest degradation (resource quality)

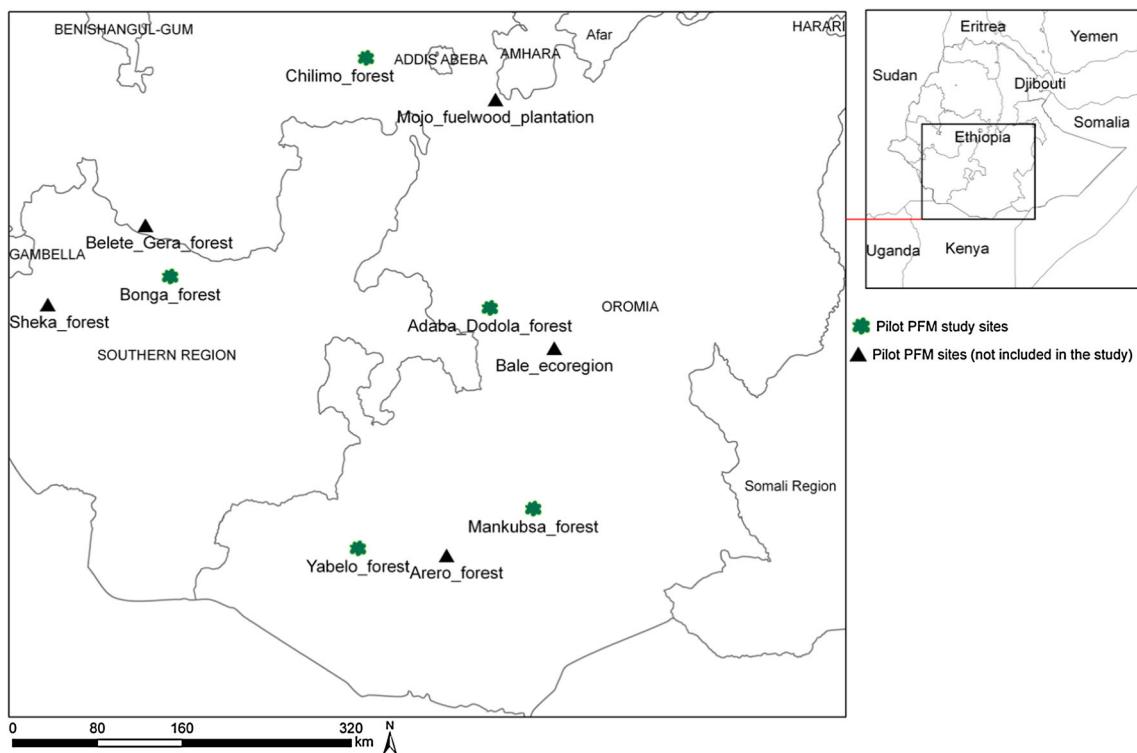


Fig. 1 Location of pilot PFM implementation and study sites in the Oromia and SNNP Regional States of Ethiopia

and distance to district forest offices (accessibility). FUGs established early in the process were preferred. At the second stage we randomly selected 10–12 persons (in total 572), both women and men, from the member list of the selected FUGs. In Mankubsa and Yabello a few of the randomly selected households could not be located and the discussions were conducted with members based on availability. To initiate the group appraisals the researcher introduced the purpose and went on to ask about perceived changes in indicators of PFM performance at the three different points in time. Indicators were the feeling of forest ownership, the condition of the forest, benefits from the forest, and institutional effectiveness. Temporal reference points were immediately before project implementation, during project implementation, and the time of data collection, i.e. after projects had ended. The proportional piling technique (Sharp 2007; Watson 1994) was used: each participant was provided with 10 maize kernels, each participant then allocated 0–10 maize kernels to indicate their perception of the level of the parameter assessed followed by detailed discussions. The feeling of ownership was assessed by asking to what degree participants had developed confidence that the forest belonged to them following the PFM

introduction, and whether they were feeling secure to invest in forest development. The forest condition was assessed based on a combined indicator: the relative abundance or shortage of common products, presence or absence of natural regeneration and the presence of valuable timber species. The assessment of forest benefits was arrived at by first listing the major cash and subsistence sources of household income and then indicating the proportion of forest income to the total. Institutional effectiveness was assessed primarily in terms of the ability of the FUGs and cooperatives to enforce their rights in relation to other parties (the forest administration, forest users and others), and also their ability to set and follow internal rules.

- (5) Finally, for specific project attributes related information and data such as extent of forest area brought under PFM, institutional arrangements, FUG's subsidiary by-laws, resource assessment methodologies, PFM guidelines and project evaluation reports, published and unpublished literature related to the PFM pilot projects were identified primarily through visits to the project offices, documents and homepages. Incomes and expenses of PFM cooperatives and Unions were gathered from their respective registration books.

Table 2 Basic information on forests and people in the pilot PFM project sites

PFM Site and location	Forest type ^a	Major ethnic groups	Settlement and Livelihood activities of FUG members	Project duration (first PFM contract signed)
1. Adaba-Dodola Oromia region, West Arsi zone, Adaba and Dodola Districts	Dry Afromontane	Oromo	Members live inside the PFM forest Major livelihood activities: Agriculture, livestock rearing, forest utilization	1996–2007 (2000)
2. Chilimo Oromia region, West Shoa Zone, Dendi District	Dry Afromontane	Oromo, small groups of Gurage, and Amhara	The majority of members live in the periphery of the PFM forest, few live inside Major livelihood activities: Agriculture, livestock rearing, forest utilization	1997–2007 (2004)
3. Mankubsa Oromia region Borana-Guji zone, Liben district	Dry Afromontane, Semi-evergreen bushland	Oromo	Members live inside and outside the PFM forest Major livelihood activities: agropastoralism, forest utilization	1999–2007 (2006)
4. Yabello Oromia Region Borana-Guji zone, Yabello district	Dry Afromontane, Semi-evergreen bushland	Oromo	Members live inside and outside the PFM forest Major livelihood activities: Agropastoralism, forest utilization	1999–2007 (2006)
5. Bonga SNNP Regional state, Kafa zone, within the south-western plateau of Ethiopia	Broadleaved moist Afromontane	Kaffa, small groups of Menja, Kembata, Amhara	Members live both inside and at the edge of the PFM forest Major livelihood activities: Forest utilization, livestock rearing, agriculture	1997–2007 (2004)

^a According to Friis (1992)

Results

History of the Pilot Projects

Management Objectives and Their Evolution Over Time

The basis for the establishment of PFM in Ethiopia was the persistence of high levels of deforestation. Therefore all the projects stated contribution to improved forest conservation as their main goal or objective. The first pilot project was established in Adaba-Dodola, and there it was quickly learned that the assumed positive effect of the involvement of communities in forest conservation would only materialize when the forest users obtain tangible benefits from their engagement. This realization, in combination with the assumption that poverty is one of the underlying drivers of deforestation and forest degradation, led to the integration of the second major PFM management objective of livelihood improvement. In Adaba-Dodola, the pilot PFM project established a direct link between forest management and income by legally allowing forest users to extract and market timber/wood based forest products. The other four pilot projects also incorporated various components supporting rural livelihoods; most of these focused on non-forest based complementary livelihood initiatives, such as improved agricultural activities through what has been called revolving fund schemes, the allocation of seed money to common funds providing credit to individual FUG members for starting small businesses and the like.

Project Management Approach

All the PFM pilot projects were introduced by INGOs, with funding from the European Union (EU) or bilateral aid. In all of the five cases the project planning phase started negotiations at the regional state level, including the selection of forests to be handed over to local users. The project coordinators were assigned by the Ethiopian government in Adaba-Dodola and Bonga and by the INGO in Chilimo, Mankubsa and Yabello. The INGOs in charge of the pilot projects hired government forest officers and other local and expatriate staff that facilitated contact with local residents to disseminate the aims and ways of working of the project, to organize local residents in FUGs and to draw up by-laws and sign PFM agreements with the government. The INGOs provided the financial and logistic support needed, and the expatriate staff facilitated training of local staff and monitored progress.

Local Expectations to PFM

Local forest users feared the consequences for their livelihoods of controlling access to forest resources through

PFM, while regional and local governments questioned the wisdom of involving local people in forest management. The bilateral and non-governmental projects devoted much of their attention to facilitate dialog and understanding in the initial phase, and over time acceptance of the PFM concept emerged. Yet, local communities voice concerns about the future of the initiative, given Ethiopia's long history of changing policies and tenure regimes on one hand and on the other hand the consistent lack of public support to the FUGs following the end of pilot project support.

The local communities expressed different motivations for engaging in PFM, and none of them shared the motivation of the local governments that mainly saw PFM as an opportunity to reduce the on-going deforestation and save the costs of forest guarding at the same time. In forests with wild coffee (Bonga) PFM was perceived to serve to prevent the government from allocating the forest land to private investors. In Mankubsa and Yabello PFM was perceived as a defense against the allocation of land to settlers from other parts of the country, while in Adaba-Dodola and Chilimo rights to commercial forest product harvest and grazing in the forest, coupled with benefits from related on-going forest-related development projects and forest plantations, provided sufficient incentives for participating in PFM.

Forest Resource Potential

Forest Resources Characteristics

Mainly natural forests, but also small areas of plantation forest, were handed over for management by FUGs (Table 3). These forests are *de jure* state or public properties. However, due to *de facto* near open access situation, clearing of forests for agriculture is a main concern in the pilot project areas, but according to the regional forest authorities the remaining forest resources are not in a highly degraded condition (Table 3). The forest types handed over range from dry afromontane to broadleaved rainforest (Table 2), and the productive potential of the forests therefore varies.

Before PFM was introduced the forests in all sites were a source of timber, non-timber forest products (NTFPs) and grazing, and a reserve for expanding the agricultural land base and for the establishment of new settlement areas. Deforestation and forest degradation was found in all sites, probably because of the near open access situation. Fire incidents were common. The Adaba-Dodola forest, for example, was reduced from 140,000 ha in the 1980s to 53,000 ha in 1997 (Tadesse 1999), and the Chilimo forest was reduced from 20,000 ha in 1980s to 5,000 ha in 1997 (Bekele 2003). The closed high forest of south west Ethiopia, where the Bonga forest is located, had dropped from 40 % cover between 1971 and 1975 to 18 % by 1997

Table 3 Forest resources and pressure in the five PFM pilot sites

PFM site	PFM Forest area (ha)		Number of households	Forest area per household (ha)	Overall forest condition	Valuable forest resources
	Natural forest (total forest area where different)	Plantation forest				
1. Adaba-Dodola	64,491 (83,000)	1,067	3,294	20	Intermediate	Timber, firewood, forest grazing, eco-tourism
2. Chilimo	4,585	415	1,600	3	Intermediate	Timber, firewood, limited other NTFPs
3. Mankubsa	16,798	17	6,875	2.5	Poor	Timber (limited), firewood, honey, forest grazing
4. Yabello	28,478	299.4	4,408	6.5	Poor	Timber (limited), firewood, honey, forest grazing
5. Bonga	34,381 (161,423)	214	8,961	4	Good	Timber (high potential), firewood, NTFPs (high potential like honey, coffee, spices)

Source for all data is district office and various secondary documents. All the forest area in Chilimo, Mankubsa and Yabello handed to FUGs. Forest size in Dodola includes Erica bush land which is about 30,000 ha. Overall forest condition refers to stand quality and density of trees per ha and is a comparative classification between the different sites: Poor, intermediate and good

(Chaffy 1979; Reusing 1998). Conversion of forests to farm land was reported to be the major source of deforestation in all sites.

In all pilot project sites the forests handed over to FUGs were influenced by human use, but according to FUG members not to such an extent that it prevented a satisfactory level of subsistence use. The timber supply potential of the forest varies among sites. In Bonga there are high quality timber trees in all diameter-classes, while in Adaba-Dodola and Chilimo the available volume is accumulated in the largest diameter-classes only, i.e. over matured trees. The Mankubsa and Yabello forests have very little standing timber volume. The most important products that can be extracted from the PFM forests include timber, firewood, forest grazing and various other types of NTFPs (e.g. honey, forest coffee, medicinal plants and spices). The plantation forests handed over, though small in size, are all mature and ready for harvest.

The average forest area handed over per member household varied greatly among the five sites. In Adaba-Dodola, where FUG members lived in the forest and practiced agriculture there, they were allowed to stay but not to expand or move their agricultural plots in the manner they had been used to in the previously practiced rotational farming system. In the other four sites FUG members lived and practiced agriculture mostly outside the forest. In Adaba-Dodola the forest area handed over was based on calculations of the site-specific ecological carrying capacity combined with an estimate of the area needed to provide FUG member households with a forest income allowing them to maintain a living standard comparable to households living outside the forest. It was estimated that a household needs 8–12 ha of land. None of the other pilot projects applied such calculations to estimate the forest area to be handed over.

Resource Pressure

After PFM, the number of users, extraction level and conversion of forests to farmland has declined as compared to before PFM. Firewood, NTFP and grazing in the forest are the three major products extracted from the forest in all sites with guidance by FUG executive committees. The state the forest has been reported to be improved after PFM in all sites due to the restricted access to the majority of the former de facto users.

Institutional Arrangements

The Local Authority

The regional governments of Oromia and SNNPRS delegated the authority to implement the pilot PFM projects to

forest departments or natural resource units under the Regional bureau of agriculture. Both of these local authorities have line offices at the district level, with staff that is upwardly accountable in the bureaucratic hierarchy. From these line offices FUGs were formally formed and contracts specifying the rights and duties of the parties were negotiated and signed. The activities required for this process to take place were all supported financially and technically by the pilot projects. Initial forest resource assessments were undertaken and management plans were formulated when the forest resources were handed over to FUGs. The anticipated re-measurements of the forest resource and revisions of management plans every 2–5 years were not, however. Repeated forest inventories to assess the state of the forest resources every 5 year were conducted in Adaba-Dodola only in June 2012, after being delayed for 3 years more. Timber harvest levels are supposed to be set annually in Adaba-Dodola (one additional tree may be extracted for each ha that has been managed, i.e. trees are pruned, climbers are cut and other weeding activities are performed), but this procedure is not followed by local authorities or FUGs. As a result the local authorities do not have an overview of the level of timber extraction. The mandate of the local authority also includes technical and legal support to FUGs. These responsibilities were performed almost exclusively by the pilot projects and were not taken up by the local authorities after projects ended. Local authorities, thus, seem to lack the resources to fulfill the responsibilities required by PFM.

The FUG Executive Committee

The mode of FUG establishment and the number of members (household heads) per FUG varied from 28 to 1,000 (Table 4). In Adaba-Dodola, the forest in a given Kebele was divided in blocks and up to 20 FUGs were formed per Kebele. In Chilimo and Bonga the settlement pattern of households living in the periphery of the forest determined the number of FUGs formed per kebele; on average two in Chilimo and one in Bonga. In Mankubsa and Yabello, where all residents in a Kebele became FUG members, the FUG boundaries did not necessarily follow Kebele boundaries with consequences of conflict in administrative issues.

In Adaba-Dodola, Chilimo and Bonga the FUG decision-making body is a democratically elected executive committee. In Mankubsa and Yabello leaders of traditional institutions were chosen to lead the FUG executive committees. The committee signs the contract with the local authority and is responsible for implementing the contract and subsidiary by-laws subsequently set up. The main responsibility of the FUG is to conserve the forest cover by preventing both non-members' encroachment and PFM

Table 4 Institutional arrangements of five Ethiopian PFM pilot projects

PFM site	Membership criteria Relative proportion of members (members per FUG)	Forest products permitted for subsistence (authority)	Forest products permitted for commercialization (authority)	Rule implementation	Actual forest cash income sources.	Benefit distribution concerns
1. Adaba- Dodola	Proximity of residence to forest; forest carrying capacity Members: 29 % of the population from 14 Kebeles adjacent to the forest. (28)	No permit: grazing or any product (wood or non- wood) from dead trees Permit: live trees (executive committee)	Permit: live trees (local authority) Permit: poles & firewood from dead and drying wood, NTFPs, forest grazing (executive committee) Permit: transport to local market (executive committee) and transport to cities (local authority)	Management plan: none By-laws: Partly implemented Local authority: no authorization of timber harvest; forest inventory in 2012	Individual sale of timber, firewood, charcoal, other NWFPs Collective sale of timber (cooperative), grazing (FUG), trophy hunting (Union)	Assignment of timber trees based on equality rather than equity; non-transparent cooperative management of timber revenues
2. Chilimo	Proximity of residence to forest. Members: 37 % from six Kebeles adjacent to the forest (133)	No permit: grazing, firewood & construction wood from dead trees Permit: live trees (executive committee & local authority— banned after 2009)	Permit: firewood (executive committee)	Management plan: none By-laws: partly implemented Local authority: no forest inventory, weak legal support	Individual sale of firewood, charcoal Collective sale of plantation timber	Plantation forestry benefit share to three FUGs only; non-transparent management of plantation revenues
3. Mankubsa	Live in forest adjacent Kebele (1000)	No permit: grazing, firewood, honey, medicinal plants, wood for construction & farm implements from dead trees Permit: live trees (executive committee & local authority)	No permit: NWFPs Permit: Firewood (executive committee)	Management plan: none By-laws: Partly implemented Local authority: no forest inventory, weak legal support	Individual sale of NWFPs, firewood, charcoal	Community development fund for 1 % of members only
4. Yabello	Live in forest adjacent Kebele (1,000)	No permit: grazing, firewood, dead wood for construction & farm implements, medicinal plants; honey Permit: live trees (executive committee & local authority)	No permit: NWFPs Permit: Firewood (executive committee)	Management plan: none By-laws: partly implemented Local authority: no forest inventory and weak legal support	Individual sale of NWFPs, firewood, charcoal	Community development fund for 1 % of members only
5. Bonga	Proximity of residence to the forest, customary use rights (172)	No permit: forest coffee, honey (beehives), medicinal plants and spices Permit: dead trees (executive committee)	No permit: NWFPs Permit: Firewood (executive committee)	Management plan: none By-laws: partly implemented Local authority: no forest inventory and weak legal support	Individual sale of NWFPs, firewood and charcoal	Exclusive rights to NTFP marketing by a few traditional owners

NWFN Non-wood forest products

members' unauthorized extraction of forest products; non-compliance may result in termination of the contract. The committee is also responsible for organizing regular meetings and for facilitating members' completion of duties, such as patrolling of the forest. FUG members require permits from the committee and the local authority to extract several forest products (Table 4), but the actual extraction activities are not monitored. It means that the executive committee and the local forest authorities do not know current forest product outtake levels. The autonomy of the FUG executive committees was threatened after the end of pilot project support—in all sites the FUGs faced problems when trying to enforce their rights, e.g. in relation to illegal forest product extraction, through the Kebele and district level enforcing agencies. In Mankubsa and Bonga the autonomy of the FUG was challenged when the Kebele administration attempted to overrule decisions made by the FUG executive committees and to reinterpret the rights and responsibilities given to FUGs.

Membership Criteria

When FUGs were established the authorities and pilot project managers set the principles for inclusion of members; two different modalities were implemented in the five sites. Membership was limited in three sites (Adaba-Dodola, Chilimo, Bonga), and the degree of forest dependence was the criterion by which members were selected. The local communities were responsible for the identification of the members, and in practice the criterion was translated into proximity of the homestead to the PFM forest (Table 4). In Adaba-Dodola a FUG consisted of 30 members at most, because a low number of members was believed to facilitate collective action. In Mankubsa and Yabello all who resided in a Kebele adjacent to the PFM forest became members. The argument was that it would be unfair to exclude any person or household residing in a forest adjacent Kebele from the extraction of forest products, and that the ensuing conflicts would threaten the sustainable management of the forest.

Rules and Their Implementation

The subsidiary by-laws of FUGs were formulated at the time of establishment, with little input from the FUG members. The by-laws are similar across the five pilot sites and include rules on forest product extraction and FUG management procedures. By-laws were only partly implemented in the five sites, and to varying degrees. Weak implementation was observed particularly in Mankubsa and Yabello (Table 4). FUG members in these two sites said that they rarely attended meetings to discuss forest management, and that they were not involved in

monitoring the forest. Most considered monitoring to be the responsibility of the FUG executive committees and few government employed forest guards. Forest guards serve as a liaison between FUGs and district forestry expert (one at each site). FUG executives explained that forest guards are gaining back their former sole forest protection responsibilities that undermined their role.

The by-laws regulate the extraction of commercial and subsistence uses of forest products. FUG members are generally free to extract forest products such as firewood and other NTFPs for their own use (Table 4). The extraction of live trees for subsistence purposes, mainly for house construction and maintenance, is allowed in four sites with permission from the FUG executive committee, and in two sites (Mankubsa, Yabello) also from the local authority. The practice was banned in Chilimo in 2009 because the local authorities suspected that the extraction presented a threat to the forest resource. The rules on live tree extraction are generally observed by FUG members: the permit is applied for and the extraction of live trees does not exceed the number allowed. Most of the live trees extracted are for house construction or maintenance, and it is therefore relatively easy to monitor whether the rules are adhered to or not.

The commercial extraction of forest products is subject to more restrictions than extraction for subsistence purposes. Commercial timber extraction is allowed only in Adaba-Dodola, where the local authority, OFWE Dodola district branch office, is supposed to authorize the extraction of, at most, one tree per ha, if activities promoting forest regeneration (thinning, pruning, weeding and transplanting wildlings) have been undertaken. This rule seems to have been forgotten, however, and timber extraction takes place without authorization or monitoring by the local authority. Other rules related to timber extraction that are not strictly followed are that only trees selected by the executive committee may be cut, that a permit is needed for individuals who transport the timber to their cooperative lumber yard, and that individuals may sell timber only to the cooperative. The cooperative, in turn, needs a permit for transporting timber to larger cities. The long-distance transport permit system is widely circumvented: timber is transported without permits or permits are used twice in the same day.

Marketed firewood consists of dead wood and the commercial extraction of it is allowed in all sites. The permit required for this activity is often not applied for because both executive committee and ordinary FUG members believe that the collection has no serious consequences for the state of the forest. NTFPs may be extracted and marketed in all sites, according to different rules. In Bonga the majority of the wild coffee and other NTFPs are owned by traditional owners, a subset of the FUG members who are *de facto* owners of coffee trees and have the right

to hang beehives in a particular forest plot. Hence, the traditional owners, which are from the same ethnic group as other FUG members, benefit more from marketing of NTFPs (coffee, honey and spices) than other members who have no previous *de facto* ownership rights.

The subsidiary by-laws stipulate that all FUGs must hold meetings regularly and that forest patrols must be organized to enforce rule compliance. In practice, however, meetings are only held and forest patrols are only operating in FUGs where membership is restricted. Patrols tend to protect forests against encroachment by non-FUG members, while there is little control with extraction of forest products by FUG members. Further, rules not enforced include fines for not attending FUG meetings and for the production of charcoal.

Fairness of Benefit Distribution

The PFM pilot project agreements made between local authorities and FUGs do not specify how benefits from the forest should be distributed. The pilot project objectives speak of 'livelihood improvement' but do not specify, for example, whether principles of equity or equality should be applied when distributing benefits. No disputes concerning the distribution of subsistence benefits are reported from the five cases, but there is substantial discontent because of the ways in which cash benefits are distributed among and within FUGs. Some FUG members offered inequity in relation to benefit distribution as a main reason for engaging in illegal forest product extraction. In their eyes the illegal activities 'set the balance right'.

In Adaba-Dodola the agreement stipulates only that members have the rights to extract and sell timber trees. Many members feel, however, that the distribution of timber trees for members by FUG executives is unfair because it does not consider their wealth status—the distribution is based on equality and not equity. Disappointment with the way benefits are distributed was also voiced in the other four cases (Table 4). In Bonga the issue of debate was the continuation of traditional rights to NTFPs, in Chilimo it was the allocation of forest plantation revenues to only the members of three FUGs, and in Mankubsa and Yabello it was the provision of project credit facilities to less than one percent of the FUG members, including many FUG executive committee members.

In relation to FUG cooperatives two concerns were expressed. The first is that their management procedures are considered far from transparent. The cooperative legislation of Ethiopia specifies that cooperatives should distribute 30 % of their income to the members as dividend (Proclamation no 147/1998). But although cooperatives in

Adaba-Dodola were established in 2006 and timber has been sold since then, members have yet to see their share of the profits. The second concern is that after the end of the pilot projects there is no financial and administrative support for cooperative establishment, and individual registration costs are born by the FUG members. Consequently cooperative formation has ceased in all sites except Adaba-Dodola, and today 25 % of FUGs in Chilimo and 89 % in Bonga are not registered. This may have serious consequences for, e.g. legal disputes, because without the registration FUGs are not legally recognized.

Outcomes of PFM in Pilot Project Sites

The quantitative results from the 52 group appraisals with 572 FUG members conducted to assess the four outcome parameters (ownership feelings, forest condition, benefits from forest and institutional effectiveness) before, during and after the implementation of the PFM pilot projects are presented in Fig. 2. The below text presents qualitative information added by participants to explain rationales behind the scoring.

Effects of Pilot Project Introduction

The introduction of PFM was perceived to have led to improved forest conditions and increased forest ownership feelings among FUGs in all sites, compared to the pre-pilot project situation. Respondents attributed the increased sense of ownership to the optimism generated by the introduction of PFM, including the formal recognition of local forest users' resource needs and the shared responsibility for forest management. The optimism and the recognition of FUG members were believed to have contributed to forest conservation in all sites. In Adaba-Dodola, Chilimo and Bonga the restriction on the number of members included in FUGs and the formalized ability to exclude outsiders were considered contributing factors. The initial increase in ownership feelings when PFM was established was highest in areas with little history of recognized forest management. In Adaba-Dodola, where the PFM members had lived inside the forest and had paid a land tax on their agricultural plots in the forest, the increase in ownership feelings was lower, but the pre-pilot project level was high in this area. In Chilimo increased ownership feelings were strengthened by the established mechanism for state-FUG benefit sharing of plantation forests benefits. The perceived impacts of PFM on the level of local benefits from the forest varied. In Mankubsa, the introduction of restrictions on forest product outtake was perceived to lead

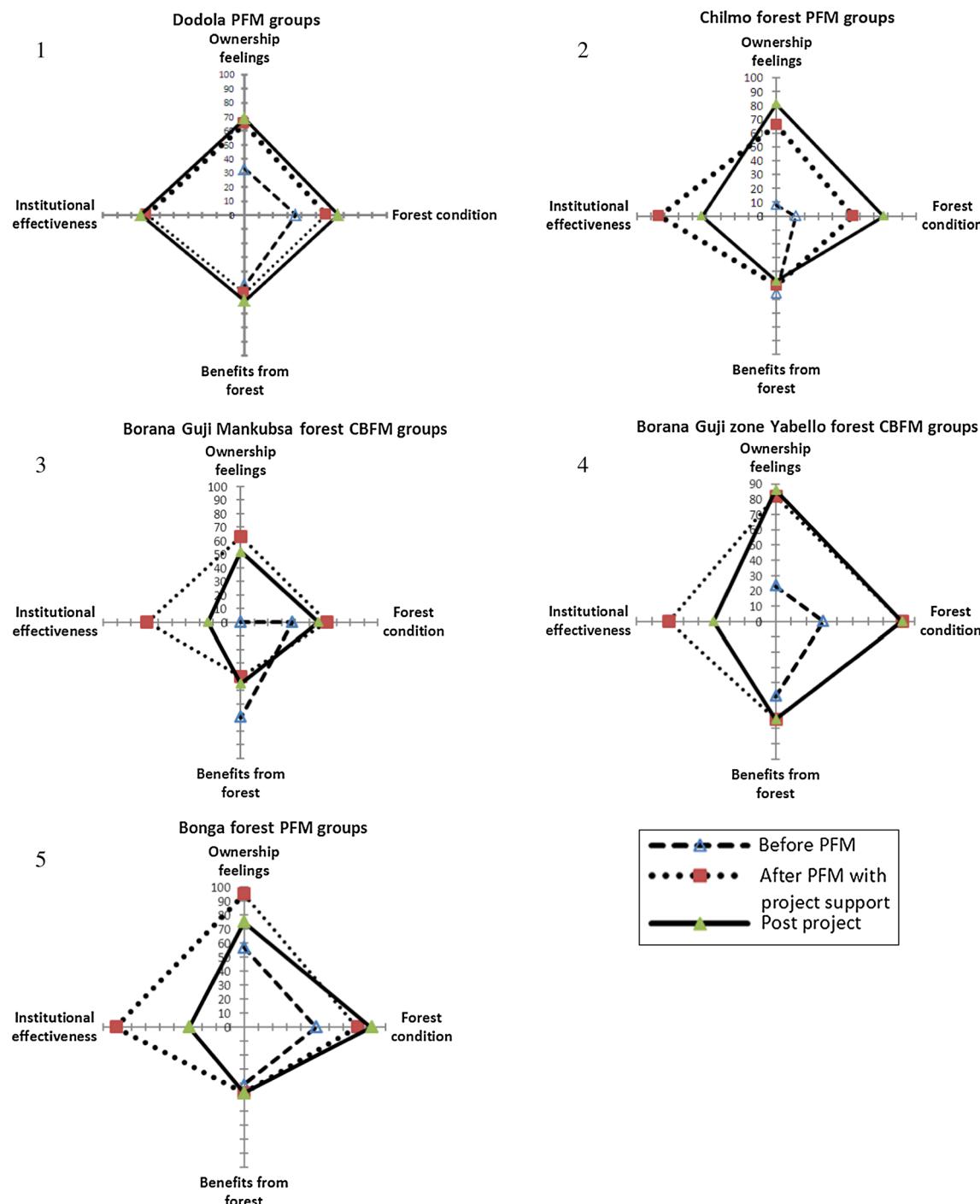


Fig. 2 Perceived levels of outcome parameters (in %) before, during and after the introduction of PFM

to markedly reduced forest benefits to forest users, while in the other four sites changes in benefits related with PFM were considered negligible. The perception of declining forest benefits in Mankubsa was attributed both to the restrictions introduced by the pilot project and to selective distribution of benefits from complementary project activities.

Post-pilot Project Situation

After the pilot projects ended and the external financial and technical support ceased, forest conditions were perceived to further improve in Adaba-Dodola, Chilimo and Bonga, to remain stable in Yabello, and to deteriorate somewhat in Mankubsa. The perceived deterioration in the condition of

Mankubsa's forest was attributed to observed cases of reversion to old practices, such as charcoal production and forest clearance for agriculture. Perceptions of improvement or stability were attributed to the establishment of a clear tenure regime, forest patrolling activities and an inclusive approach toward the forest product needs of non-members. For example, in Adaba-Dodola a few hectares of forest land adjacent to the boundary of the PFM forest were assigned for use by non-members. Little change was perceived in the levels of benefits from the forest in any of the sites.

After the end of the pilot projects the local authorities were assumed to take over where the pilot projects left off. The most apparent effect perceived by FUG members was a dramatic (on average 39 %) decrease in perceived institutional effectiveness in all but the Adaba-Dodola site. This was the result of FUGs inability to obtain primarily legal support from the authorities (the Kebele and district level law enforcing agencies as well as the district OFWE and agricultural development offices), especially for the legal persecution of outsiders encroaching on the forest. In Bonga and Mankubsa the perceived decline was also a consequence of local authorities' attempts to undermine FUG autonomy. In Yabelo the decline in institutional effectiveness and ownership feelings were lower than in Mankubsa because the former project still has office there and it to some degree facilitated support from the local authorities. In Chilimo the perceived institutional efficiency dropped when the project ended, but ownership feelings increased. The explanation for this was that the state chose to share revenues from plantation timber harvest and that they found themselves very effective in excluding non-FUG members. In the only site with perceived institutional stability, Adaba-Dodola, the perceived level of ownership feelings stayed constant. Here FUGs mentioned that their cooperative and Union provided the support they used to get from the former project.

Discussion

This study set out to evaluate the impact of the Ethiopian PFM program on forest conservation and rural livelihoods, and the appropriateness of the established institutional arrangements. In all of the five cases studied the introduction of PFM led to improved forest conditions, according to FUG members. The results thereby confirm previous studies reporting early (during project implementation) positive effects of PFM on the state of the forest (Gobeze et al. 2009; Takahashi and Todo 2012). Importantly, this study also shows that in four of the five cases the improvement in the forest conditions was perceived to be maintained 3 years after the external project supports

had ended. Furthermore, in the four sites with maintained forest improvement the introduction of PFM had no negative consequences to FUG members' levels of forest benefits. The four cases vary in terms of forest types, cultural backgrounds and implementing non-governmental agencies, indicating the general success of the PFM pilot project approach. The deviant case, Mankubsa, where the initial improvement in the state of the forest was succeeded by a reversion to the previous practices of charcoal production and clearing of forest land for agriculture is, at the same time, the only case where the introduction of PFM was perceived associated with declining forest benefits to the rural forest users.

Perception based assessments of forest conservation impacts may be influenced by a variety of factors, in addition to the state of the forest being assessed (Lund et al. 2009). However, the findings presented here are based on 52 group appraisals of predefined parameters and are confirmed by forest authorities. Furthermore, forest inventories carried out in 2012 validate the results by confirming that in one of the sites, Adaba-Dodola, the state of the forest has been maintained over the past 8 years (personal communication with Dodola OFWE branch office), in terms of both forest area and standing biomass. In Chilimo, change detection exercise that compared forest cover of 2003 and 2012 also showed same trend (Kebebew 2012).

The successful forest conservation is partly attributed to the high degree of stakeholder consultation during the introduction of PFM, and to the increased ownership feelings resulting from the authorities' formal recognition of local users' rights to forest products and abilities for forest management. Another likely contributing factor is that the forest areas handed over per FUG member were, to some degree, associated with the ecological consequences of the allowed harvest. Much larger forest areas were handed over per FUG member where commercial timber extraction is allowed (20 ha) compared to sites where only NTFPs may be marketed (2.5–6.5 ha). It is not clear, however, why the types of allowed extracted products vary so that timber extraction is allowed in one site, but not in the others. What the study does show, however, is that commercial timber extraction is a feasible option for local forest management, provided local resource supplies and demands are taken into account.

It is commonly held that collective action will arise especially when the group of users involved in the management of a limited natural resource is relatively small (Agrawal 2001; Agrawal and Gibson 1999). In this study, the effect of the two strategies for forming FUGs, the inclusive versus the exclusive approach, on forest conservation appear to be similar, however. The forests are perceived to be conserved in areas with and without

membership restriction. It is noteworthy, though, that rule observance is higher in sites with restricted membership, indicating higher levels of group identity and therefore potentially higher likelihood of continued collective action in these sites (Agrawal 2001). It is also noteworthy that in the one site where sustainable commercial timber extraction seems to be practiced, membership is restricted. Newly established PFM programs in Ethiopia apply the inclusive model of FUG membership, possibly because effects of membership restrictions in areas with overlapping forest and livestock reliance are considered too harsh, and provide limited access to forest products. However, the inclusive approach may be at the expense of restricting commercial extraction of trees from forest. Theory and results from the present study indicate that this strategy may not work in the longer term.

After the donor funded pilot projects ended the FUGs looked to the legal and local forest authorities for legal and technical advice and for institutional support, but were disappointed. Such experiences are not unusual when project support is phased out (Hobley 1996; Springate-Baginski and Blaikie 2007). Consequently, the ability of the FUGs to assert their rights was greatly reduced, and this resulted in decreased levels of perceived institutional effectiveness in all sites, but Adaba-Dodola, where the income generated from timber extraction enabled FUG cooperatives and the Union to set up provisions for FUG support. FUG cooperatives and the Union in Adaba-Dodola provided awareness creation and training to their members, ran their activities smoothly and defended their interest in front of police or court as per the contract agreement. The ownership feelings, which had initially risen greatly with the legal recognition of the FUGs, declined markedly in Mankubsa and Bonga after the projects ended because the Kebele authorities challenged the autonomy of the FUGs. In Chilimo the ownership feelings increased when the local authorities shared the income from harvesting of timber from plantation forests with FUGs. A study by Mohammed and Inoue (2013) in Chilimo also showed that PFM resulted in increased benefits from plantation forest. Ownership feelings toward the forest resource are associated with the likelihood of adoption of project objectives, and thus of forest conservation (Gautam and Shivakoti 2005). Therefore the promotion of ownership feelings by formal recognition and support before and after the implementation of the PFM pilot projects is important to take into account in the further management of the Ethiopian PFM program if the goals of forest conservation and livelihood improvement are to be met.

The information gathered from key informants and group discussions show that a fundamental discussion is

needed in relation to an important aspect of the institutional arrangements set up: the principles behind benefit distribution in PFM groups. The contracts specifying the formal requirements to procedures and rules do not include guidance on benefit distribution. Some FUG members clearly are of the opinion that the distribution of benefits should follow principles of equity, i.e. that the poorest FUG members should benefit more than the wealthier, but until now this has not been the practice. Inequitable distribution of benefits from PFM is found in many parts of the world and may have negative impacts on the institutional effectiveness of FUGs (e.g. Klooster 1999; Thoms 2008; Überhuaga et al. 2011), but not necessarily to such a degree that conservation outcomes are affected (Thoms 2008). Nevertheless, transparency concerning the distribution of PFM benefits is essential for households' informed choice regarding whether to participate in PFM or not, and for the construction of viable institutional arrangements. With more than a decade's experience of PFM it is time that Ethiopia considers this type of second-generation issues (Lawrence 2007).

The decision to introduce PFM in Ethiopia, and fundamental parts of the PFM institutional framework, including principles for the formation of FUGs and modes of forest product exploitation, were externally imposed (Mohammed and Inoue 2012) and made by national and regional decision makers together with INGOs. Stakeholders at lower administrative and grass root levels were informed but not consulted, and the process can arguably be characterized as deconcentration (Manor 1999). PFM in Ethiopia was initiated and supported technically and financially by external parties, donors and INGOs. It meant that the concept of PFM had to be internalized by both the authorities and the local forest users, who had very different motivations for engaging in the program. As the perceived declines in institutional effectiveness and ownership feelings indicate, the local authorities have not taken up the responsibilities PFM assumes them to. Neither have the FUGs, illustrated by the only partial observance of rules. The authorities agreed with the project objective of conservation, but did not trust local forest users to deliver it, while FUG members' motivations evolved around rural security and rural livelihood concerns. To integrate the concept of PFM with national, regional and local level forest management, it appears that a higher degree of communication among the different types of stakeholders is needed to both build trust and to find viable ways of institutional management. A noteworthy finding from this study is that the acceptance of timber commercialization in Adaba-Dodola led to the enhancement of local institutional capacities, while no such development was observed in the other sites.

Conclusion and Implications

The first pilot PFM projects in Ethiopia have resulted in forest conservation compared to the previous near open access situation without diminishing the forest benefits accruing to FUG members. The one case where PFM affected FUG members' forest incomes negatively is the one case where forest conservation was considered less successful. The results also indicate, however, that the persistence of the PFM program in Ethiopia is challenged primarily by the lack of support from the authorities to the FUGs. If a decentralization program is not acknowledged and supported by the local authorities, it is unlikely to be successful (Manor 1999), in this case to conserve the forest resources as well as to contribute benefits to FUG members. If PFM in Ethiopia is to be successful in the longer term, it seems there is a need to increase the knowledge level of both FUG members and representatives from local authorities concerning the mutual responsibilities, and to construct incentive mechanisms that will favor the implementation of these responsibilities. It is interesting in that regard to look into, for example, the detailed mechanisms behind the apparently sustainable community based commercial timber exploitation in Adaba-Dodola. The present study has shown that factors of importance to the success of PFM include formal recognition of and support to local institutions in charge of forest management, the resources handed over for local management and the rules on resource use should allow PFM members to generate meaningful benefits and principles of benefit distribution need to be discussed.

The involvement of forest users in the design of the Ethiopian PFM program has been limited and as the program expands it becomes important to discuss key issues in its design. If the introduction of PFM in Ethiopia is, indeed, based on the beliefs mentioned, that local forest users are better suited than central authorities for sustainable forest management and that forest incomes may take people out of poverty, a more people-centered approach to PFM is necessary. To maintain a long-term interest in the PFM program, and to avoid the need for complementary activities that will be difficult to sustain, the PFM program could favorably include more participation of FUGs in the aspects of membership inclusion, benefit distribution, and forest assessment and extraction levels (Fraser et al. 2006). The Ethiopian PFM program was initiated in response to external interests, and there is now a need for the state to take ownership of the process. Various pilot projects have gained valuable experiences, and it would seem relevant that these served as input to the formulation of a national PFM strategy. Yet, current PFM expansions remain based on the discretion of the individual donors and NGOs. We observe that the current Ethiopian PFM activities focus to a

large degree on linking up their programs with additional incentives likely to emerge from global initiatives, such as Reduction of Emissions from Deforestation and Forest Degradation (REDD+). The implications of such programs for PFM efficiency and equity are not clear (Phelps et al. 2010), however, and we suggest that the Ethiopian PFM programs need to address the institutional weaknesses identified in this study before engaging with other objectives, such as REDD+. This is advisable so as to not risk jeopardizing the chances of success both in PFM and the new initiatives.

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